

> Features

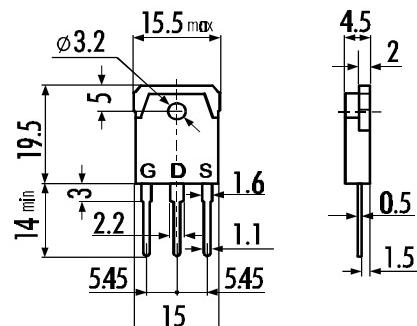
- High Speed Switching
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Voltage
- $V_{GS} = \pm 30V$ Guarantee
- Repetitive Avalanche Rated

> Applications

- Switching Regulators
- UPS
- DC-DC converters
- General Purpose Power Amplifier

> Outline Drawing

TO-3P

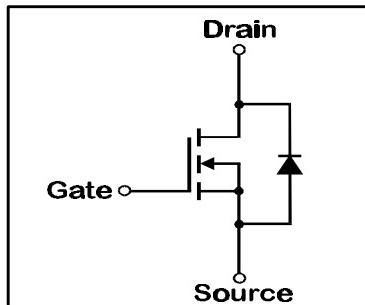


> Maximum Ratings and Characteristics

- Absolute Maximum Ratings ($T_C=25^\circ\text{C}$), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	450	V
Continous Drain Current	I_D	10	A
Pulsed Drain Current	$I_{D(\text{puls})}$	40	A
Gate-Source-Voltage	V_{GS}	± 35	V
Repetitive or Non-Repetitive ($T_{ch} \leq 150^\circ\text{C}$)	I_{AR}	10	A
Avalanche Energy	E_{AS}	255	mJ
Max. Power Dissipation	P_D	100	W
Operating and Storage Temperature Range	T_{ch}	150	$^\circ\text{C}$
	T_{stg}	-55 ~ +150	$^\circ\text{C}$

> Equivalent Circuit



- Electrical Characteristics ($T_C=25^\circ\text{C}$), unless otherwise specified

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	450			V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	3,5	4,0	4,5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=450\text{V}$ $T_{ch}=25^\circ\text{C}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$		10	500	μA
Gate Source Leakage Current	I_{GSS}	$V_{GS}=\pm 35\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	$I_D=5\text{A}$ $V_{GS}=10\text{V}$		0,58	0,65	Ω
Forward Transconductance	g_{fs}	$I_D=5\text{A}$ $V_{DS}=25\text{V}$	3	6		S
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$		950	1450	pF
Output Capacitance	C_{oss}			180	270	pF
Reverse Transfer Capacitance	C_{rss}			80	120	pF
Turn-On-Time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$t_{d(on)}$	$V_{CC}=300\text{V}$ $I_D=10\text{A}$		25	40	ns
	t_r			70	110	ns
Turn-Off-Time t_{off} ($t_{off}=t_{d(off)}+t_f$)	$t_{d(off)}$			70	110	ns
	t_f	$V_{GS}=10\text{V}$ $R_{GS}=10\ \Omega$		50	80	ns
Avalanche Capability	I_{AV}	$L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	10			A
Diode Forward On-Voltage	V_{SD}	$I_F=2xI_{DR}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1,1	1,65	V
Reverse Recovery Time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0\text{V}$ $-dI_F/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		400		ns
Reverse Recovery Charge	Q_{rr}			5,0		μC

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-a)}$	channel to air			35	$^\circ\text{C/W}$
	$R_{th(ch-c)}$	channel to case			1,25	$^\circ\text{C/W}$

N-channel MOS-FET

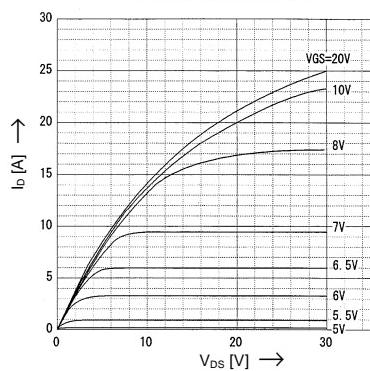
450V 0,65Ω 10A 100W

2SK2639-01
FAP-II Series

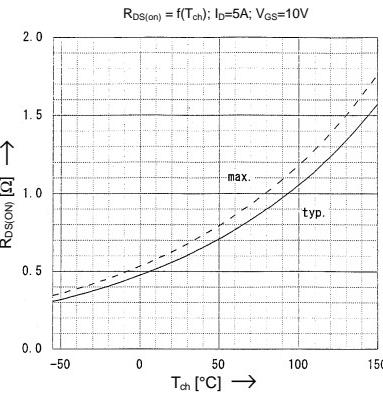
FUJI
ELECTRIC

> Characteristics

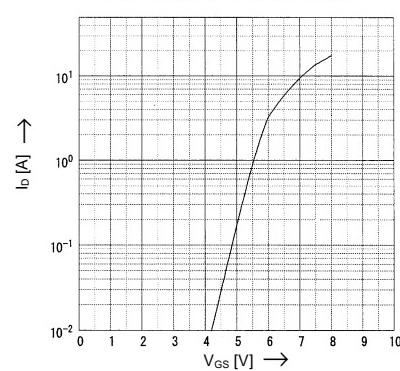
Typical Output Characteristics
 $I_D=f(V_{DS})$; 80μs pulse test; $T_C=25^\circ C$



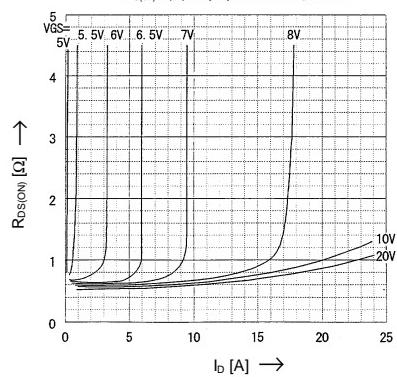
Drain-Source On-State Resistance vs. T_{ch}



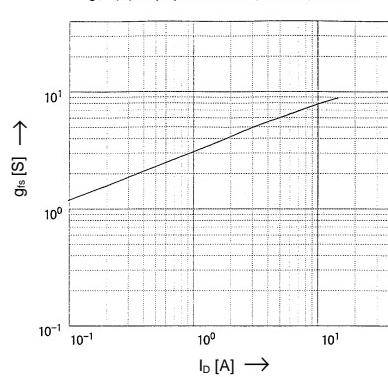
Typical Transfer Characteristics
 $I_D=f(V_{GS})$; 80μs pulse test; $V_{DS}=25V$; $T_{ch}=25^\circ C$



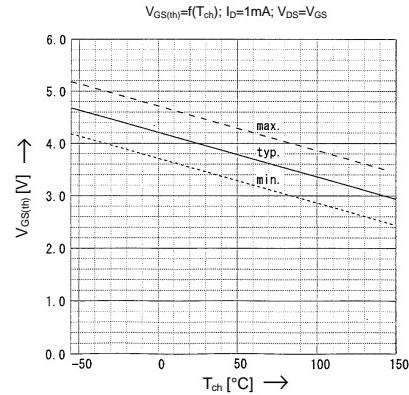
Typical Drain-Source On-State-Resistance vs. I_D
 $R_{DS(on)}=f(I_D)$; 80μs pulse test; $T_C=25^\circ C$



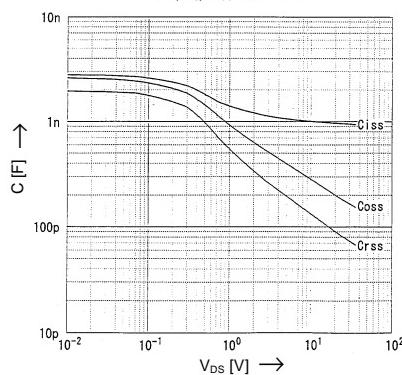
Typical Forward Transconductance vs. I_D
 $g_{fs}=f(I_D)$; 80μs pulse test; $V_{DS}=25V$; $T_{ch}=25^\circ C$



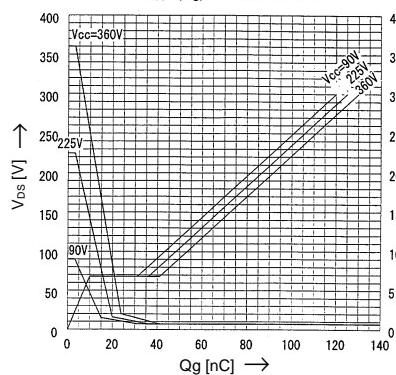
Gate Threshold Voltage vs. T_{ch}



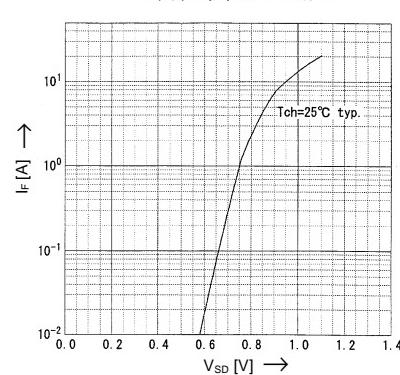
Typical Capacitances vs. V_{DS}
 $C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$



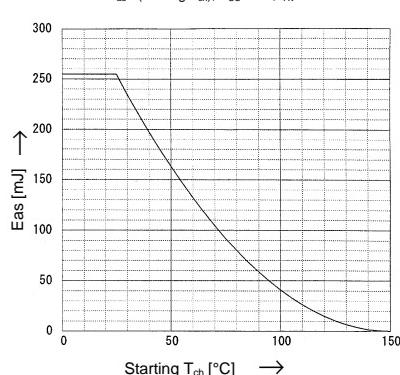
Typical Gate Charge Characteristic
 $V_{GS}=f(Q_g)$; $I_D=10A$; $T_c=25^\circ C$



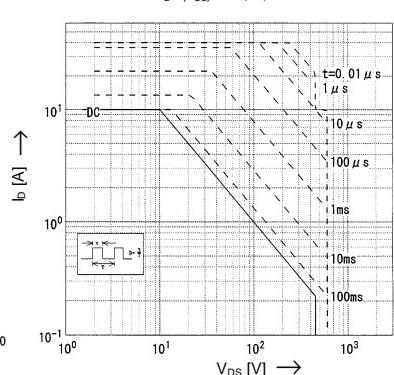
Forward Characteristics of Reverse Diode
 $I_f=f(V_{SD})$; 80μs pulse test; $V_{GS}=0V$



Avalanche Energy Derating
 $E_{as}=f(\text{starting } T_{ch})$; $V_{CC}=45V$; $I_{AV}=10A$



Safe Operation Area
 $I_D=f(V_{DS})$; $D=0.01$, $T_c=25^\circ C$



Transient Thermal impedance

